BIC

48

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BEAN IMPROVEMENT COOPERATIVE

A Voluntary and Informal Organization
to Effect the Exchange of Information and Materials

REPORT

of the

BEAN IMPROVEMENT COOPERATIVE

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A NOTE TO MEMBERS

The Program Committee of BIC in cooperation with the Pea Improvement Association, has designated Baltimore, Maryland, as the site for the biennial meeting. The BIC meeting is scheduled December 1, 1965, in Baltimore, Maryland. The PIA meeting will follow--on December 2, at the same meeting place. If you have suggestions relative to the program write to Dr. Ed Crosby, National Canners Association, 1950 Sixth St., Berkeley, California. You will receive a notice of the program, and speakers, later this year. Other members of the program committee are Wm. Hollis, Iver Jorgenson, Walter Pierce, Art Sprague.

In this BIC report is a valuable compilation of gene symbols for Phaseolus vulgaris L. The Germ Plasm Committee carries responsibility for the listing. Please contact Dr. S. Honma, Michigan State University, Horticulture Department, East Lansing, Michigan, for information, suggestions, contributions relative to the list.

We welcome the continued interest and support of members in other nations.

All members are asked to contact individuals--in industry and/or in public institutions-- who may be interested in BIC and invite them to join.

Annual dues have been maintained at $1. 00. Thus far, this has covered expenses. The gene list will add to the expense the current year.

The report is compiled within a few days following the deadline. If reports reach the chairman after typing has begun, but before final completion, they will appear at the end of the report--out of alphabetical order.

It is not feasible to place bibliographies following given reports. It is possible to place references, of a reasonable number, in the annual bibliography. Authors, in such case, should refer in their note to names of authors, with year of publication, so that the reader may be able to check the references without undue effort. Numbered references in the brief reports are difficult to handle.

During each year a few members write that they apparently have not received the annual report. If the report has not been received prior to June 1 of the year of issue, please so indicate prior to July 1.

An occasional member finds that the report has been received but has been misplaced. It will be necessary to charge for copies of the report after July 1--effective in 1966.

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LIST OF GENES - PHASEOLUS VULGARIS L.

The Germ Plasm Committee for BIC (S. Honma, Chairman; Dermot Coyne; F. L. Smith; Don Wallace; S. H. Yarnell) presents, herewith, a list of genes for Phaseolus vulgaris L. Except for the gene pa, the list was compiled by S. H. Yarnell, and the Committee is deeply indebted to him for providing the compilation.

A - a basic color factor, producing yellow-brown (13, 72, 84, 85). It is the equivalent of P, which has priority.

A - used schematically for several characters: indeterminate versus a determinate growth (7, 56), now Fin (23), also in^{+} (62); with B and C many internodes (7, 56); as a major contributor with B and C, to hybrid vigor (49); adds 1 cgm. to a minimum seed weight(73); confers resistance to the alpha race of anthracnose (51).

ace - produces shiny pod (87).

Aeq - with P T E Uc Unc and Rst or Rma darkens the banner petal (26, 36); with Sal the effect is similar to V (37).

Am - with No and Sal geranium flower color, and scarlet flower with Beg No Sal (37, 47).

an - appears to have the functions of P (11).

aph - plants have only two leaves, both unifoliate, 4 to 6 nodes, and are sterile (44).

Arc and arc - combine with Bip and bip to produce seed-coat patterns based on the hilum (31).

Are - confers resistance to four races of anthracnose (50).

Arg - with Y produces a "silver" or greenish gray pod (35), formerly s (3, 4); arg with y gives a white pod (4, 35).

Asp - seed coat glistens (32), an effect also assigned to the color genes J and Sh; ASp dull seed coat.

Av - with Iv produces a supersensitive (top necrosis) type of resistance to common bean mosaic (1, 57); with iv results in susceptibility to this disease.

av - with sv confers a recessive resistance to common bean mosaic (1, 57).

B - originally a "blackener", producing anthocyanin with the basic color gene P = A (71, 72, 85). According to Feenstra (8) this gene is the equivalent of the G of Shaw and Norton (70), the F of Kooiman (12), the Z of Sirks (72) and the V of Lamprecht (15) and Prakken (58). It is the equivalent of Feenstra's C (8).

B - as currently used by Lamprecht (15, 29, 38). With P gives a seed coat that is whitish with a pale lilac tinge, his Vielchen-artig Weiss, with a yellowish brown hilum ring; described by Smith (77) as gray-white. With other color factors it changes chamois to bronze (15). According to Prakken (58, 59) B with the basic color factors produces a gray-greenish-brown seed coat without a hilum ring, and changes yellow-brown to brown. Its use with suitable genes as a bluing factor (15, 58, 72, 84) appears to be similar to its original concept; this effect is regarded by Smith (75) to be due to a distinct gene, Bl. Similar or equivalent genes, according to Feenstra (8) are the C of Tschermak (85), the D of Shull (71), the E of Kooiman (12), the H of Shaw and Norton (70) and the L of Sirks (72).

B - like A, B has been used schematically for several characters such as long internode, and, in addition, each B gives one extra internode (7). With A and C it is a major contributor to hybrid vigor (49). It adds 1 cgm. to a minimum seed weight (73).

B1 B2 - multiple genes of equal value for seed breadth (9).

Bip and bip - combine with Arc and arc to form seed-coat patterns based on the hilum (18, 31).

Beg - with P Gri gives begonia red flower color (37).

Bl - with the basic color factors produces purple-violet seed coat (75, 82, 83), changes oxblood red to purple (75), and is responsible for bluish tints to plant colors (82).

bl - with appropriate genes red seed coat (83).

Br - with P R^k brown seed coat (76).

br - with P R^k green seed coat, but with P r^k pink seed coat (76); considered by Lamprecht (48) to be identical with Och.

C - with P Gri, sulfur-white or primrose yellow testa; no color in the hilum ring (15, 29, 39, 84). According to Feenstra (8) this C is the equivalent of the B of Tjebbes (79) of Kooiman (12) and of Sirks (72), and the Cm of Prakken (58).

C c - inconstant mottling with color genes (15, 29, 59, 70, 85).

C - like A and B, has been used schematically for several characters. Each C gives one extra internode (7); a major contributor with A and B to hybrid vigor (49); adds 1 cgm to a minimum weight of seed (73).

C^r - with P Gri V gives a bluish violet seed coat, violet flower and a violet tinge to other plant parts (8); the equivalent of Lamprecht's R (30).

C^s - the same as Lamprecht's Rst (34).

C^u - produces a creamish testa (8).

Ca - with color genes, caruncula stripe (17).

Can - with color genes gives a whitish (Speckweiss) testa (29) or blubber white (38), with a yellowish brown hilum ring (29).

Cav - causes a wrinkling of the testa radiating from the caruncula (42). The heterozygote is less distinct.

chl - pale green chlorophyll deficiency (54).

Cor - dark corona around hilum (20, 27).

Cor cor - pale corona with white flowers (20, 27).

cor - no corona, flowers light laelia (20, 27).

cry - a dwarfing gene; with Fin intermediate height (52); with la produces a slender type of growth in bush but not in tall forms (35).

D - color gene with basic factors (8, 12, 58, 84); has a dark hilum ring (59). According to Lamprecht (45) this D is the equivalent of his B.

D - (schematic) adds 1 cgm. to a minimum weight of seed (73).

Da - straight pod (16).

Db - polymeric with Da for straight pod (16, 35).

diff - with ex p gives solid color testa except for one end of the seed (31).

dis - mottled or striped flower of scarlet runner bean (40).

dw_1 dw_2 - duplicate genes causing dwarf plant (52).

E - required for complete coloring of seed coat (6).

e - with t, partial coloring of seed coat such as eye pattern (6, 21, 64, 75); similar to Bip, Lamprecht's virgarcus eye gene (18, 31).

E - intensifier with color genes (84).

Ea Eb - polymeric genes for "flat" pod, elliptical in cross-section vs. ea eb round pod (16, 35, 86).

Epi - interspecific gene for epigeal cotyledon (33, 44).

exp - with diff gives solid color to seed coat except for one end of the seed (31).

Ext - interspecific gene for external stigma in P. coccineus (33).

F - was used as a color gene by Shaw and Norton (70) with basic genes and their C for yellow to produce coffee-brown. It was also used similarly by Kooiman (13) with C for yellow or orange-brown plus E, producing coffee brown, to give black (A B C E F). The combinations A B F, A C F and A D F had pale lilac flowers (84) perhaps the equivalent of v_{lae}. The gene is no longer recognized.

F - confers resistance to the F strain of anthracnose (51).

Fa - basic gene for pod membrane (16).

Fb, Fc - supplementary genes for pod membrane (16).

fa fb fc - weak pod membrane; pod may be constricted (16); may give 9:7, 15:1 or 63:1 ratios.

fast - fastigate shape of seed (20).

Fin (fin^+) - indeterminate vs. fin determinate plant growth (23); long vs. short internode; later vs. earlier flowering.

Flav - has a light yellow influence (38) on seed-coat color; previously considered to be recessive (29).

G - with P Gri grayish white (Speckweiss) testa; changes chamois to yellow-brown (bister); gives its color in various combinations to the hilum ring (15, 19, 27, 29, 72). Used similarly by Prakken (58, 59) except that he believes it gives color to the caruncula stripe instead of the hilum ring. The yellow-brown factor. The equivalent of C of Shaw and Norton (70).

gas - causes both male and female sterility (41a).

Gri - one of the two basic color factors (27).

gri - with P grayish white (blubber white) testa without a hilum ring (27, 38).

H - described by Shaw and Norton (70) as producing light brown or olive. Considered by Feenstra (8) as the equivalent of the D of Shull (71), the C of Tschermak (85), the E of Kooiman (13), the L of Sirks (72), the B of Lamprecht (29), the B of Prakken (58), the B of Feenstra (8), and the Bl of Smith (75).

Hyp - interspecific gene for hypocotyl expression (43).

I - reduces seed weight by 3 cgm. (73).

i_1 - inhibits the action of P (53).

i_2 - inhibits the action of V with respect to the color of the hypocotyl and testa; is lethal with v_{lae} (53).

Ia Ib - parchmented vs. ia tender pod (35). Flat or deep (elliptical cross-section) vs. round pod (16, 35, 47).

ico - internodes 4-7 cm. long instead of the normal 8-11 cm. (46).

ie - similar to the action of i_1; also inhibits the action of B and G (55); considered by Lamprecht to be the equivalent of c (48).

ilo - 5-7 long internodes in the inflorescence instead of the usual 2-3 (46).

in - determinate growth (62); see fin; in^+ is indeterminate.

inh - inhibits the action of V (32).

Ins - with appropriate factors gives light buff (29) or raw silk (38) testa; has a hilum ring.

Int - interspecific gene for internal stigma of P. vulgaris (33).

iter - with ram triple branches inflorescence (23, 25).

J - with P Gri gives light yellow-brown or pale ochraceous buff testa (19), Rohseidengelb testa (29), raw silk testa (15, 38) and the same color to the hilum ring (38). The equivalent of the Sh of Prakken (58). Similar in effect to Ins (27). It causes seed coats to glisten and to darken with age (29).

L. - long vs. 1 short internodes (35, 56).

L - inhibits the effect of t on partial coloring of the testa (66). L and l combine with Z and z to produce several color patterns (67).

L1 L2 - genes of equal value for height of plant (56). They also increase length of seed (9).

La - gives short vs. la long internode; la with Fin is dwarf; la cry fin is slender (35).

lin - produces veined petals (26).

lo - plants have a short inflorescence (44).

M - responsible for constant (non-segregating) mottling of the seed coat; the colors depend on other genes (5, 71, 75, 76, 80). Later shown to be an allel of R and redesignated Rma (34). M was originally used by Shull (71) for inconstant mottling.

M^{st} - causes striping of the seed coat (76); redesignated Rst (34).

mar - broad colored zone around hilum ring (19).

mi - micropilar stripe pattern (20).

Mic - small dots near the micropile (32).

miv - end of seed flattened and a short distance between funicles (41).

mo - conveys resistance to bean virus 2 (68).

neu^{+} neu - short day vs. day neutral flowering response to length of day (62).

No - with V Sal and Am nopal red (light salmon with brownish tinge) flower color; no geranium to salmon red (37, 47).

Nud - with P Gri gives purple, waxy stem and crimson flowers (26).

Och - with P Gri C j gives ochre yellow tints such as ochraceous, Hell Lohfarben, light tawny brown, tawny olive to clay (19, 29); has colored hilum ring (29); epistatic to Vir (29).

P - basic color gene with Gri (5, 14, 58, 66, 70, 71, 74). P without Gri and color genes is colorless as is p (29, 75). According to Feenstra (8) P is the equivalent of the A of Tschermak (85) of Kooiman (12) and of Sirks (72).

P - (schematic) increases vigor with A B C (49).

pa - pale green leaves (74a).

punc - causes dotting of the testa (32).

Pur - with Ro P Gri has a deep purple pod (39).

pur - with Ro P Gri gives rose pod (39); both Pur ro and pur ro have a green pod.

R - with P Gri produces a red seed coat (6, 22, 82) that has been variously described as light vinaceous (82), light purple vinaceous (34) and deep oxblood red (75) the differences possibly due to modifying genes. The flowers are red (84). It does not affect the color of the hilum ring (29).

Rcir - lateral accumulation of medium sized spots on the testa (34).

Rma - constant warbling of the seed coat (34, 78). With Ro and Pur marbling of the pod (30, 39).

Rres - sprinkled or speckled seed coat (30, 34).

Rrho - rhomboid spotting of the testa (34).

Rst - striped seed coat (30) and pod (34).

Rr - indistinct, inconstant mottling of the seed coat (30, 34, 75).

r - white seed coat (6, 30, 34). R, Rcir, Rma, Rres, Rrho, Rst and r are allelic.

R - (schematic) increases vigor with A B C (49).

r r_1 - together confer resistance to root-knot nematode (2).

ram - branched inflorescence (23).

ri - confers resistance to bean virus 1 (57) and 2 (61).

Rk - with P Gri J pinkish buff seed coat (10, 75); with Sh chamois or cream testa (78).

rk - with r for white seed gives a pink or red testa (75); with Sh gives testaceous (the buff of kidney bean) testa (75, 76); r^k Sh are dominant over red-brown but recessive to cream (75, 78); not effective with C but modifies J (48).

rk^d - with Sh red-brown or garnet-brown testa (78). Found in 'Dark Red Kidney'.

Ro - with P Gri rose pod color (39).

S - striping on seed coat and pod (13, 29, 72, 75, 81, 85); considered by Lamprecht (34) to be due to Rst.

s - silver pod; with y white pod (4); see arg.

S - (schematic) increases vigor with A B C (49).

Sal - with P and Am salmon to geranium red flower color and a reddish tinge to the testa; with Aeq the effect is similar to V (37).

sal - with P and Am give clear amaranth flower (47).

Sh - with P Gri creamish shiny testa with brown hilum ring (29); color darkens with age (59). The equivalent of J (45).

sh - dull (mat) seed coat (59).

St - stringy pod; st may be somewhat stringy (58); has modifiers.

Sur - causes leaves and petals to point downward (28). See Xsu.

Sv - with av and iv confers resistance to common mosaic (57).

T - self-colored seed coat and colored flowers (6, 21, 70).

t - a pattern gene; required for eye patterns (66, 70); functions with e, Z and z (21, 63, 70).

T - twining habit vs. t non-twining (56).

te - pod short (5-8 cm.) and narrow (47).

Th_1 Th_2 - genes of equal value for seed thickness (9).

To - cell wall fiber (58).

tri - produces three cotyledons (46).

Uc Unc - with appropriate genes darken the banner petal (36).

uni - unifoliate leaves (24).

V - with P Gri produces pale glaucescens testa without a hilum ring (29). The color ranges from pale violet to black depending upon other color genes present (15, 58). According to Feenstra (8) V is the equivalent of the B of Shull (71) and of Tschermak (85), the F of Kooiman (13), the G of Shaw and Norton (70), and the Z of Sirks (72).

V_{lae} - with P Gri gives laelia flowers and rose stem (26).

v_{pal} - with P Gri gives clear light red flowers (27).

v - white flowers (26). V, v_{lae}, v_{pal}, and v are alleles.

Vir - with P Gri C virescens or greenish shades on the testa (19); among these are Russgrum or olive black.

X x - early designation for inconstant mottling of the seed coat (5) now C c (30).

X_{su} - causes the leaves and petals to point downward (46); effect the same as Sur.

Y - with Arg produces green pod; with arg gives a greenish gray (silvery) pod (35).

y - with Arg produces yellow pod; with arg the pod is white (4, 35).

Z - similar to e in affecting size of eye pattern on seed coat (75, 85); enters into sellatus and piebald patterns (21); with L and t accounts for seven seed coat patterns (67).

Z - constant mottling of the seed coat (80); now Rma.

Z1 - self-colored seed coat (85) the equivalent of T.

Z2 - pigment extender (85).

LITERATURE CITED

1. Ali, Mohamed A. Genetics of resistance to the common bean mosaic virus (bean virus 1) in the bean (Phaseolus vulgaris L.). Phytopath. 40: 69-79. 1950.

2. Barrons, K. C. Root-knot resistance in beans. Jour. Hered. 31: 35-38. 1940.

3. Currence, T. M. Inheritance studies in Phaseolus vulgaris. Minn. Agr. Exp. Sta. Tech. Bul. 68. 1930.

4. Currence, T. M. A new pod color in snap beans. Jour. of Hered. 22: 21-23. 1931.

5. Emerson, R. A. Factors for mottling in beans. Amer. Breed. Assn. 5: 368-376. 1909.

6. Emerson, R. A. Inheritance of color in seeds of the common bean, Phaseolus vulgaris. Neb. Agr. Exp. Sta. Rept. 22: 65-101. 1909.

7. Emerson, R. A. A genetic study of plant height in Phaseolus vulgaris. Neb. Agr. Exp. Sta. Res. Bul. 7: 3-75. 1916.

8. Feenstra, W. J. Biochemical aspects of seedcoat color inheritance in Phaseolus vulgaris L. Mededel. Landbouwhogesch. 60(2): 1-53. 1960.

9. Frets, G. P. The heredity of the dimensions and the weight of the seeds of Phaseolus vulgaris. Genetica 25: 338-356. 1951.

10. Gloyer, W. O. The two new varieties of red kidney bean: Geneva and York. N. Y. Geneva Agr. Exp. Sta. Bul. 145. 1928.

11. Hilpert, M. M. Genetic studies in Phaseolus vulgaris. Summ. Ph. D. Thes. Univ. Minn. 3: 19-20. 1949.

12. Kooiman, H. N. On the heredity of the seed-coat color in Phaseolus vulgaris. 98 p. Bussum, van Dishoeck. Utrecht. 1920.

13. Kooiman, H. N. Monograph on the genetics of Phaseolus, (especially Ph. vulgaris and Ph. multiflorus). Bibliogr. Genetica. 8: 295-409.

14. Kristofferson, K. B. Color inheritance in the seed coat of Phaseolus vulgaris. Hereditas 5: 33-43. 1924.

15. Lamprecht, Herbert. Beiträge zur Genetik von Phaseolus vulgaris. Zur Vererbung der Testafarbe. Hereditas 16: 169-211. 1932.

16. Lamprecht, Herbert. Beiträge zur Genetik von Phaseolus vulgaris. II. Über Vererbung von Hülsenfarbe und Hülsenform. Hereditas 16: 295-340. 1932.

17. Lamprecht, Herbert. Beiträge zur Genetik von Phaseolus vulgaris. III. Zwieter Beitrag zur Vererbung der Testafarbe. Hereditas 17: 1-20. 1932.

18. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, IV. Studien über Genenkoppelung, mit einem Fall von erblich bedingtem welchselnden Crossoverprozent. Hereditas 17: 21-53. 1932.

Lamprecht, H. Zur Genetik von Phaseolus vulgaris, V. Spaltungsergebnisse nach Kreuzung einer weissamigen mit gefärbtsamigen Bohenlinien. Hereditas 17: 54-66. 1932.

19. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, VI. Viertar Beitrag zur Vererbung der Testafarbe. Hereditas 17: 249-316. 1933.

20. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, VII. Zwei weitere Gene für Sameneigenschafte, Cor und Fast. Hereditas 19: 163-176. 1934.

21. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, VIII. Über Farbenverteilung und Vererbung der Teilfarbigkeit der Testa. Hereditas 19: 177-222. 1934.

22. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, IX. Über den Einfluss des Genpaares R-r auf die Testafarbe. Hereditas 20: 32-46. 1935.

23. Lamprecht. H. Zur Genetik von Phaseolus vulgaris, X. Über Infloreszenztypen und ihre Vererbung. Hereditas 20L 71-93. 1935.

24. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, XI. Eine Mutante mit einfachen Blattern und ihre Vererbungsweise. Hereditas 20: 238-250. 1935.

25. Lamprecht, H. Komplexe und homologe Mutationen insbesondere bei Phaseolus vulgaris, Ph. multiflorus und Pisum sativum. Hereditas 20: 273-288. 1935.

26. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, XII. Über die Vererbung der Bluten- und Stammfarbe. Hereditas 21: 129-166. 1936.

27. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, XIII. Ein neues Grundgen für Testafarben, ein weiteres Testafarben sowie etwas über Blutenfarben. Hereditas 22: 241-268. 1936.

28. Lamprecht, H. Über einen Phaseolus - Typus mit abwärts geneigten Blättern und seine Vererbung. Bot. Notiser 1937: 341-354. 1937.

29. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, XIV. Über die Wirkung der Gene P, C, J, Ins, Can, G, B, V, Vir, Och und Flav. Hereditas 25: 255-288. 1939.

30. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, XV. Über die Vererbung der Merfarbigkeit Testa. Hereditas 26: 65-99. 1940.

31. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, XVI. Weitere Beiträge zur Vererbung der Teilferbigkeit. Hereditas 26: 277-291. 1940.

32. Lamprecht, H. Zur Genetik von Phaseolus vulgaris, XVII-XVIII. Hereditas 26: 292-304. 1940.

33. Lamprecht, H. Intra- and interspecific genes. Agr. Hort. Genet. 3: 45-60. 1945.

34. Lamprecht, H. The seven allels of the gene R of Phaseolus. Agr. Hort. Genet. 5: 46-64. 1947.

35. Lamprecht, H. The inheritance of the slender-type of Phaseolus vulgaris and some other results. Agr. Hort. Genet. 5: 72-84. 1947.

36. Lamprecht, H. Die Terminalverstärkung der Blütenfarbe von Phaseolus vulgaris und ihre Vererbung. Agr. Hort. Genet. 6: 49-63. 1948.

37. Lamprecht, H. On the effect and linkage of genes transmitted from Phaseolus coccineus to Ph. vulgaris. Agr. Hort. Genet. 6: 64-81. 1948.

38. Lamprecht, H. Die Vererbung der Testafarbe bei Phaseolus vulgaris L. Agr. Hort. Genet. 9: 18-83. 1951.

39. Lamprecht, H. Über die Vererbung der roten Hülsenfarbe beir Phaseolus vulgaris. Agr. Hort. Genet. 9: 84-87. 1951.

40. Lamprecht, H. Ein Phaseolus coccineus - Typ mit scheckigen Blüten und seine Vererbung. Agr. Hort. Genet. 9: 135-138. 1951.

41. Lamprecht, H. Ein Gen fur truncata - samen bei Phaseolus. Agr. Hort. Genet. 10: 105-112. 1952.

41a. Lamprecht, H. Weitere Kopplungsgruppen von Phaseolus vulgaris. Agr. Hort. Genet. 10: 141-151. 1952.

42. Lamprecht, H. Die Vererbung der Caruncula-warze bei Phaseolus vulgaris und die Kopplungsgruppe Sur-Y-Cau-Te-Miv-P. Agr. Hort. Genet. 13: 143-153. 1955.

43. Lamprecht, H. Artifizielle Umwandlung einer Spezies in eine andere. Agr. Hort. Genet. 15: 194-206. 1957.

44. Lamprecht, H. Weitere Studien über die aphyllus - Mutant von Phaseolus vulgaris. Agr. Hort. Genet. 16: 103-111. 1958.

45. Lamprecht, H. The synonymy of the genes Sh and D with J and B for the seed coat color of Phaseolus vulgaris. Agr. Hort. Genet. 18: 205-208. 1960.

46. Lamprecht, H. Die Vererbung eines Phaseolus - typs mit drei Kotyledon sowie über die Wirkung von drei neven Genen. Agr. Hort Genet. 19: 333-343. 1961.

47. Lamprecht, H. Weitere Kopplungsstudien an Phaseolus vulgaris mit einer Übersicht über die Koppelungsgruppen. Agr. Hort. Genet. 19: 319-332. 1961.

48. Lamprecht, H. Die Vererbung der rezessiv roten Testafarbe von Phaseolus. Sowie Bemerkung en zur Manifestation und Symbolik von Testafarbgenen. Agr. Hort. Genet. 19: 344-359. 1961.

49. Malinowski, E. Experiences sur les hybrides du Phasolus vulgaris et le probleme de l'heterose (" heterosis "). Mem. de l'Inst. die Genet. de l'Ecole sup. d'Agr. a Varsovie 2: 1-68. 1924.

50. Mastenbrock, C. A breeding programme for resistance to anthracnose in dry shell haricot beans, based on a new gene. Euphytica 9: 177-258. 1960.

51. McRostie, G. P. Inheritance of anthracnose resistance as indicated by a cross between a resistant and a susceptible bean. Phytopath. 9: 141-148. 1919.

52. Nakayama, R. Genetical studies of French beans. I. On the inheritance of abnormal dwarfness. (Bull. Fac. Agr. Hirosaki Univ.) 3: 26-29. 1957.

53. Nakayama, R. Genetical studies on kidney beans (Phaseolus vulgaris). II. On the inheritance of hypocotyl color. (Bull. Fac. Agr. Hirosaki Univ.) 4: 80-87. 1958.

54. Nakayama, R. Genetic studies on kidney beans (Phaseolus vulgaris). III. On inheritance of chlorina-a type of chlorophyll deficiencies. (Bull. Fac. Agr. Hirosaki Univ.) 5: 1-5. 1959.

55. Nakayama, R. Genetic studies on kidney beans (Phaseolus vulgaris). IV. On the inheritance of hypocotyl color 2. (Bull. Fac. Agr. Hirosaki Univ.) 5: 6-13. 1959.

56. Norton, J. B. Inheritance of habit in the common bean. Amer. Nat. 49: 547-561. 1915.

57. Petersen, H. J. Beiträge zur Genetik der Reaktion von Phaseolus vulgaris L. auf Infektion mit Phaseolus-Virus 1 Stamm Voldagsen. Zeit. Pflanzenzücht. 39: 187-224. 1958.

58. Prakken, R. Inheritance of colors and pod characters in Phaseolus vulgaris L. Genetica 16: 177-294. 1934.

59. Prakken, R. Inheritance of colors in Phaseolus vulgaris L. Genetica 22: 331-408. 1940-41.

60. Richards, B. L., and W. H. Burkholder. A new mosaic disease of beans. Phytopath. 33: 1215-1216. 1943.

61. Rudorf, W. Die Übertragung der Kasistenz gegen die Bohnenmosaik-Viren 1 (gewohnliches Bohnenmosaik) und 2 (gelbes Bohnenmosaik) aus Phaseolus coccineus in fertile Bastardpflanzen aus der Kreuzung Phaseolus vulgaris x Phaseolus coccineus. Naturwissensch. 42: 19-20. 1955.

62. Rudorf, W. Genetics of Phaseolus aborigineus Burkart. Proc. X Intern. Cong. Genet. 2: 243. 1958. (Abst.).

63. Sax, K. The association of size differences with seed-coat pattern and pigmentation in Phaseolus vulgaris. Genetics 8: 552-560. 1923.

64. Sax, K. and H. C. McPhee. Color factors in bean hybrids. Jour. Hered. 14: 205-208. 1923.

65. Schertz, K. F., W. Jurgelsky, Jr. and W. C. Boyd. Inheritance of anti-A_1 hemagglutinating activity in lima beans, Phaseolus lunatus. Proc. Nat. Acad. Sci. 46: 529-532. 1960.

66. Schreiber, Fritz. Zur Genetik der weissen Samenfarbe bei Phaseolus vulgaris. Züchter 6: 53-61. 1934.

67. Schrieber, F. Die Genetik der Teilfarbung der Bohnensamen (Phaseolus vulgaris). Zeit. Abst. Vererb. 78: 59-114. 1940.

68. Schroeder, W. T. and R. Provvidenti. A strain of bean virus 2 that overcomes resistance in pea conditioned by the mo mo genotype. Phytopath. 52: 751. 1962. (Abst.)

69. Sen, N, K, and J. G. Bhowal. Genetics of Vigna sinensis (L.) Savi. Genetica 32: 247-266. 1961.

70. Shaw, J. K. and J. B. Norton. The inheritance of seed coat color in beans. Mass. Agr. Exp. Sta. Bul. 185. 1918.

71. Shull, G. H. A new Mendelian ratio and several types of latency. Amer. Nat. 42: 433-451. 1908.

72. Sirks, M. J. The color factors of the seed coat in Phaseolus vulgaris L. and in Ph. multiflorus Willd. Genetica 4: 97-138. 1922.

73. Sirks, M. J. The inheritance of seedweight in the garden bean (Phaseolus vulgaris). Genetica 7: 119-169. 1925.

74. Skoog, H. A. Studies on host-parasite relations of bean varieties resistant and susceptible to Psudomonas phaseolicola and toxin production by the parasite. Phytopath. 42: 475. 1952. (Abst.)

74a. Smith, F. L. Pale: An hereditary chlorophyll deficiency in beans. Jour. Amer. Soc. Agron. 26: 893-897. 1934.

75. Smith, F. L. A genetic analysis of red seed-coat color in Phaseolus vulgaris. Hilgardia 12: 551-616. 1939.

76. Smith, F. L. Inheritance of seed-coat color in derivatives of Pinto beans. Jour. Amer. Soc. Agron. 39: 1039-1052. 1947.

77. Smith, F. L. Seed-coat color genes in six commercial varieties of beans. Hilgardia 31: 1-14. 1961.

78. Smith, F. L., and Chatherine B. Madsen. Seed-color inheritance in beans. Interaction of the alleles at the R, Rk and Bl loci in Phaseolus vulgaris. Jour. Hered. 39: 190-194. 1948.

79. Tjebbes, K. Die Samenfarbe in Kreuzungen von Phaseolus vulgaris x multiflorus. Hereditas 9: 199-208. 1927.

Tjebbes, K. Two linkage groups in the garden bean. Hereditas 15: 185-193. 1931.

80. Tjebbes, K. and H. N. Kooiman. Erfelijkheidsonderzoekingen bij boonen. I. Kruising van Kievitsboon en bruine boon (Cross of dwarf Prague bean and yellow bean). II. Constante gevlektheid bij een spontane bastaard van Phaseolus vulgaris (True breeding mottling in a spontaneous hybrid of Ph. vulgaris). Genetica 1: 323-346. 1919. (French summ.)

81. Tjebbes, K. and H. N. Kooiman. Erfelijkheidsonderzoekingen bij boonen. III. Albinisme. Genetica 1: 532-538. 1919. (Engl. summ.)

82. Tjebbes, K. and H. N. Kooiman. Erfelijkheidsonderkingen bij boonen. IV. Over den strepingsfactor. Een geval van volkomen afstooting tusschen twee factoren. V. Analyse eener spontane kruising van de stokkievitsboon. Genetica 3: 28-40. 1921. (Not seen).

83. Tjebbes, K. and H. N. Kooiman. Erfelijkheidsonderzoekingen bij boonen. VI. Vervolg van de proeven met kievitsboonen. (Continuation of the experiments with Speckled Cranberry beans). Genetica 4: 62-63. 1922. (French summ.)

84. Tjebbes, K. and H. N. Kooiman. Erfelijkheidsonderzoikingen bij boonen. VII. Bloemkleur en zaadhuidkleur. (Flower color and seed coat color). VIII. Over de erfelijkheid van de eigenschap dorschbaarheid van de peul. (On the genetics of parchmented and tender pods). Genetica 4: 447-456. 1922. (French summ.)

85. Tschermak, E. von. Bastardierungsversuche an Levkojen, Erbsen und Bohnen mit Rucksicht auf die Faktorenlehre. Zeits. Abst. Vererb. 7: 81-234. 1912.

86. Tschermak, E. von. Ueber den gegenwärtigen Stand der Gemüsezüchtung. Zeits. Pflanz. Zücht. 4: 65-104. 1916.

87. Yen, D. E. A shiny-podded mutant in pole bean (Phaseolus vulgaris L.). N. Z. Jour. Sci. Tech. Sec. A. 38: 820-824. 1957.

STOCKS AVAILABLE FOR EXCHANGE

Coyne, Dermot P.
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University of Nebraska
Lincoln, Nebraska

1. Phaseolus acutifolius, Tepary bean. (Tolerance to common blight, bacterial wilt, heat and drought.)
2. G. N. Nebraska #1 late maturing selection. (Tolerance to common blight.)
3. PI 165078. High tolerance to bacterial wilt.

Frazier, W. A.
Horticulture Department
Oregon State University
Corvallis, Oregon 97331

1. OSU 9822. Determinate Romano type bean.
2. OSU 949 and 2065. Bush beans derived from backcrossing to Blue Lake as recurrent parent; being released; high temperature sensitive.
3. OSU 3340 wax bean; tender pod, near Blue Lake wax bush; probably high temperature sensitive.
4. Dark green savoy leaf mutant - single gene recessive.

Lorz, A. P.
Vegetable Crops Department
University of Florida
Gainesville, Florida

1. P. polystachyus.
2. Putative amphidiploid "P. lunastachyus" derivatives from P. lunatus (var. Fordhook) x P. polystachyus.

Voysest-Voysest, Oswaldo
Estacion Experimental Agricola La Molina, Apartado 2791
Lima, Peru, South America

Beans from high altitude that pop when roasted.

Wester, Rober E.
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Plant Industry Station
Beltsville, Maryland 20705

Three green seeded Fordhook types, U. S. 561, 861, and 1061, are available for 1965 trials. These lines are resistant to downy mildew strain A and differ from Fordhook 242 in having shorter racemes that set a concentrated set of pods below the dark green foliage. The beans reach maturity about 5 days later than Fordhook 242.

Two white-seeded Fordhook types, U. S. 261 and 761, are available for 1965 trials. These lines are resistant to downy mildew strain A and differ from Fordhook 242 by having smaller plants that mature their pods about 5 days earlier.

STOCKS DESIRED

Coyne, Dermot P.
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University of Nebraska
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1. Bush Blue Lake lines for trial in Nebraska.
2. Phaseolus vulgaris lines tolerant to heat and drought.

Frazier, W. A.
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1. Upright, stiff, bush, round, green and/or wax types with low fibre.
2. Lines resistant to one or more of the following diseases: bean yellow mosaic virus, halo blight, fuarium root rot.
3. Upright, stiff, bush, flat pod types with low fibre.
4. Wax bean turning wax color very early in pod development; low fibre waxes with good habit.
5. Lines with high pod:plant ratio.

Wallace, D. H.
Plant Breeding Department
Cornell University
Ithaca, New York 14850

1. Accessions with resistance to halo blight race 2.
2. Lines which, when flowering commences, essentially cease to grow vegetatively and divert the larger proportion of their photosynthate to fruit and seed development.
3. Lines considered to be high yielding or physiologically efficient in one or more attributes.

Zaumeyer, W. J.
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Any red and black-seeded, mosaic-resistant segregates (pole or bush), regardless of generation, for possible selection studies in El Salvador.

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BIBLIOGRAPHY

Adamova, O. P. 1962. Evaluating the Phaseolus collection for bacterial resistance. Bul. Appl. Bot. Gen. Plt. Breeding (Russian) 34:124-34.

Allard, R. W. 1963. Evidence for genetic restriction of recombination in the lima bean. Genetics 48: 1389-95.

Allard, R. W. 1963. An additional gametophyte factor in the lima bean. Zuchter 33: 212-16.

Al-Yasiri, S. and D. P. Coyne. 1964. Effect of growth regulators in delaying pod abscission and embryo abortion in the interspecific cross Phaseolus vulgaris x P. acutifolius. Crop Science 4: 433-435.

Al-Yasiri, S., and D. P. Coyne. 1964. Interspecific hybridization in the genus Phaseolus. Abst. Amer. Soc. Hort. Sci. 14.

Armstrong, G. M., and J. K. Armstrong. 1964. Lupinus species -- common hosts for wilt fusaria from alfalfa, bean, cassia cowpea, lupine, and U. S. cotton. Phytopath. 54: 1232-1235.

Atkin, John D. and W. J. Zaumeyer. 1964. White Seeded Tendercrop, a new snap bean for canning. Seed World 94(8): 16. April.

Bateman, D. F. 1964. Cellulose and the rhizoctonia disease of bean. Phytopath. 54: 1372-1377.

Buttenschon, H. 1963. The genetics of virus resistance in Phaseolus vulgaris and its use in breeding garden beans. Z. Pflanzenz. 50: 9-20.

Coyne, D. P. 1964. Species hybridization in Phaseolus. Jour. of Heredity. 55: 5-6.

Coyne, D. P. and M. L. Schuster. 1964. Bean research program. Nebraska Experiment Station Quarterly. Vol. 10, No. 4: 13-14.

Coyne, D. P., and M. L. Schuster. 1964. Inheritance of common blight tolerance and date of flowering in beans. Abst. Amer. Soc. Hort. Sci. 13-14.

Coyne, D. P., and R. H. Mattson. 1964. Inheritance of time of flowering and length of blooming period in Phaseolus vulgaris L. Proc. Amer. Soc. Hort. Sci. 85:

Deverall, B. J. and J. C. Walker. 1963. A physiological difference between bean leaves (Phaseolus vulgaris) resistant and susceptible to halo blight, caused by Pseudomonas phaseolicola. Ann. Appl. Biol. 52: 105-15.

Deverall, B. J. and J. M. Daly. 1964. Comparison of some processes in homogenates and sections of healthy bean leaves resistant and susceptible to the bacterial halo blight disease. Jour. Exp. Bot. 15: 308-313.

Dewey, D. L. 1963. Cell dynamics in the bean root tip. Radiation Bot. 3: 259-63.

Dhaliwal, A. S., L. H. Pollard and D. K. Salunkhe. 1964. Biosynthesis of starch grains in cotyledons of Phaseolus species. Proc. Amer. Soc. Hort. Sci. 85: 361-365.

Dongo, S. 1964. Identificacion de virus del frijol. (Bean virus identification) Serv. Invest. Prom. Agraria Informe Especial No. 9. Lima, Peru.

Grogan, R. A., and K. A. Kimble. 1964. The relationship of severe bean mosaic virus from Mexico to Southern Mosaic virus and its related strain in cowpea. Phytopath. 54: 75-78.

Hubbeling, N. 1963. Complications in testing bean varieties for resistance to Phaseolus virus 1 as a consequence of the occurrence of aberrant virus strains. Meded. LandbHogesch. Gent. 28: 1025-33.

Lam Sanchez, A. and Clibas Vieira. 1964. Inheritance of pod color in Phaseolus vulgaris L. Rev. Ceres 12: 106-118 (Portuguese, with English summary).

Lunin, J., M. H. Gallatin and A. R. Batchelder. 1964. Interactive effects of soil fertility and salinity on the growth and composition of beans. Proc. Amer. Soc. Hort. Sci. 85: 350-360.

Mack, H. J., S. C. Fang, and S. B. Apple, Jr. 1964. Effects of soil temperature and phosphorus fertilization on snap beans and peas. Proc. Amer. Soc. Hort. Sci. 84: 332-338.

Maurer, C. L. and Ralph Baker. 1964. Ecology of plant pathogens in soil. I. Influence of chitin and lignin amendments on development of bean root rot. Phytopath. 54: 1425-1426.

Nash, Shirley M., and W. C. Snyder. 1964. Dissemination of the root rot fusarium with bean seed. Phytopath. 54: 880.

Panzer, J. D. and R. L. Nickeson. Delayed synergism of bacterial blight and bean mosaic on Phaseolus vulgaris. Plt. Dis. Reptr. 43: 133-136. 1959.

Patel, P. N. and J. C. Walker. 1963. Changes in free amino acid and amide content of resistant and susceptible beans after infection with the halo blight organism. Phytopath. 53: 522-28.

Reid, W. D. 1945. Resistance of beans to halo blight and anthracnose and the occurrence of bean mosaic and bean weevil. New Zeal. Jour. Sci. and Tech. 27: 331-335. (1946) (PBA 16: 402.)

Robinson, W. B., D. E. Wilson, J. C. Moyer, J. D. Atkin, D. B. Hand. 1964. Quality versus yield of snap beans for processing. Proc. Amer. Soc. Hort. Sci. 84: 339-347.

Schuster, M. L. A method for testing resistance of beans to bacterial blights. Phytopath. 45: 519-20. 1955.

Schuster, M. L., D. P. Coyne and Kamla Singh. 1964. Population trends and movement of Corynebacterium flaccumfaciens var. aurantiacum in tolerant and susceptible beans. Plant Dis. Rept. 48: 823-827.

Shands, Henry, Clibas Vieira, and W. J. Zaumeyer. 1964. Observations on dry bean diseases in Brazil. Plant Disease Reptr. 48(10): 784-787.

Shepherd, R. J. 1964. Properties of a mosaic virus of cowpea and its relationship to the bean pod mottle virus. Phytopath. 54: 466-73.

Smith, S. H. 1964. The distribution of clover yellow mosaic virus in Vicia faba root tips. Phytopath. 54: 1273-1277.

Valenta, J. R. and H. D. Sisler. Evidence of a chemical basis of resistance of lima bean plants to downy mildew. Phytopath. 52: 103-37. 1962.

Vieira, Clibas. 1962. Bean improvement in the State of Minas Gerais, Brazil. Actas de la V Reunion Latinoamericana de Fitotencia, Tomo II, p. 460-463. (Spanish)

Walker, J. C. and P. N. Patel. 1964. Inheritance of resistance to halo blight of bean. Phytopath. 54: 952-954.

Wester, R. E., John MacLeod, and J. W. Heuberger. 1964. The occurrence and decline of downy mildew on lima beans in the Middle Atlantic States. Plant Disease Reptr. 48: 316-317.

Wester, R. E. 1964. Effect of seed size on plant growth and yield of Fordhook 242 bush lima bean. Amer. Soc. Hort. Sci. 84: 327-331.

Wester, R. E., W. W. Goth, and R. E. Webb. 1964. Transmission of downy mildew by slugs. Phytopathology 54: 749. Abstract.

Zaumeyer, W. J., R. W. Goth, and R. E. Ford. 1964. A new streak-producing virus of pea related to red clover vein mosaic. Plant Disease Reptr. 48(6): 494-498.

Zaumeyer, W. J. and R. W. Goth. 1964. A new severe symptom-inducing strain of common bean mosaic virus. Phytopathology 54 (11): 1378-1387.

Zaumeyer, W. J. and R. W. Goth. 1963. Two new types of local lesions produced on beans by the common bean mosaic virus. Phytopathology 53(4): 490-491.

Zaumeyer, W. J. 1964. Two new strains of alfalfa mosaic virus systemically infectious to bean. Phytopathology 53(4): 444-449.

Financial Statement - February 1965

Typing BIC letter, memo, proofreading, assembling, addressing envelopes, etc.	7½ hrs. at 1.88	$14.10
Typing, proofreading, running, and assembling of BIC Report	47 hrs. at 1.88	88.36
Addressing envelopes, stuffing, stamping (for BIC Report)	6 hrs. at 1.88	11.28
68 mimeograph stencils at .08		5.44
14 reams mimeograph paper at 1.30 (#24)		18.20
½ ream " " at 1.10		.55
#10 printed envelopes (142)		1.50
10 x 13 Manila envelopes $1.75 per 100 (130)		2.28
1 correction fluid at .39		.39
2 paste ink at $2.43		4.86
Postage		
Letter		15.00
Report		17.50
TOTAL EXPENSES REPORT NO. 8		179.46
CURRENT BALANCE FOR DUES TO DATE		249.53
MINUS YEARS PAID IN ADVANCE		61.00
TRUE BALANCE		$ 9.07